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LECTURE ON

CHLOROFORM,

AND OTHER

NARCOTIC VAPOURS,

Delivered at the Royal Medico-Botanical Society, March 16, 1848,

By JOHN SNOW, M.D.

(*From the London Medical Gazette.*)

Dr. Snow considered the introduction of the use of ether vapour for the prevention of pain second only to the discovery of vaccination, in the direct benefit it conferred on mankind, and second only to the discovery of the circulation of the blood, in the advantages it would confer on medical science. Chloroform was in some respects an improvement over ether, which, however, was the great discovery.

He then described the physiological effects of chloroform, dividing them into five degrees, and said that the description he gave was applicable to ether, and to some other vapours. The pulse was more or lese accelerated during inhalation of either chloroform or ether, and was not diminished in power when the effects of the vapour were not carried too far, unless sickness was induced, which was apt to occur if the inhalation took place soon after a meal, and deep insensibility was induced. It was not easy to lay down any rules with respect to the state of the pupil, but the sensibility of the edge of the eyelid affords a very good sign: when this was abolished, the knife might be used without causing a flinch; but it is not always necessary to wait for this symptom.

He mentioned some cases in which ether and chloroform had enabled the surgeon to reduce old dislocations, and strangulated hernia by the taxis, when otherwise an operation must have been performed.

There was, on an average, less mental excitement from chloroform than from ether; but the rigidity and struggling which occasionally occurred in the third degree was certainly as frequent from the former as from the latter agent, if not more so. Chloroform was eight or ten times more powerful in its effects than the same quantity of ether; and he was now in a position to explain the reason of this. He had examined a great number of volatile liquids, and he found that the power of them all was in an inverse ratio to their solubility in water, and consequently in the blood; that is to say, that the more soluble they were, the greater was the quantity required to produce a given effect.

The table suspended in the room exhibited a number of these liquids, in the order of their solubility, and the power of a given quantity of each is in the same order:—

Alcohol Pyroxilic Spirit Acetone	Soluble in all proportions.	
Acetate of Oxide of Methyle	50	
Acetate of Oxide of Ethyle	15	
Oxide of Ethyle, (Sulphuric Ether)	10	2300
Nitrate of Oxide of Methyle	6	
Iodide of Ethyle	1	
Chloroform	0·5	144
Bromoform	About the same.	
Bichloride of Carbon	0·4	100
Bisulphuret of Carbon	0·13	50
Benzin Metacetone	Also very sparingly soluble.	

The first column shewed the quantity of liquid, by measure, that 100 parts of water

8689

would dissolve; the second, the quantity of vapour.

There was great difficulty in ascertaining the exact solubility of the very sparingly soluble substances, but he had endeavoured to determine it by presenting them to the water in form of vapour. Chloroform he found to be soluble in about 200 parts of water, although it had been said to require 2000. The physiological strength of the vapours he had ascertained by inhaling small quantities himself, and by placing small animals in closed but capacious glass jars, with proportions of vapour determined by weighing—a mode of investigation which he believed would lead to a knowledge of the modus operandi of these vapours. The first three substances in the table produced but little effect when inhaled; it was only the last and most volatile that would induce narcotism at all in a moderate time by the vapour it gave at common temperatures: the next on the list was very soluble, and produced but little effect: the fifth, or acetic ether, was more powerful, but less so than sulphuric ether, which in its turn was less powerful than the same quantity, by measure, of the nitrate of oxide of methyle.

All the others were very powerful. The bichloride of carbon he had made as directed in the last edition of Turner's Chemistry, by passing chlorine gas through chloroform in the sunshine: hydrochloric acid gas was given off by combination of chlorine with the hydrogen, whilst another atom of chlorine took its place, and a liquid, consisting of 2 carbon, 4 chlorine, was produced; it boiled at 154°, and not at 173°, as stated in the work referred to; it had a specific gravity of 1·557, had a very slight but agreeable odour, and its vapour was between 5 and 6 times as heavy as atmospheric air. He had given it in three cases of tooth-drawing at St. George's Hospital, when it produced the same effects as chloroform, but was rather longer in doing so, on account of its being less volatile, which might be some advantage, but not sufficient to recommend its general adoption. The bisulphuret of carbon, he understood, had been used in Sweden; it was very powerful; the vapour from twenty minims had made him nearly insensible; and 3 grs. of it, put into 100 cubic inches of air in which a bird was placed, rendered it totally insensible in less than two minutes. It had, however, such a fœtid odour that it could not be introduced into practice in this country, even if desirable in other respects.

At the conclusion of the lecture, a bird was put under the influence of ether, and a guinea-pig under that of chloroform: they recovered in due time. The latter animal was placed in a jar containing 800 cubic inches of air, to which were added 24 grs. of chloroform, and insensibility was induced in 3 or 4 minutes. Dr. Snow remarked that if less than 12 grains had been introduced, the animal would not have been rendered insensible in so large a jar, but would only have become intoxicated; for it required $1\frac{1}{2}$ grs., or rather more than 1 cubic inches of vapour to 100 cubic inches of air, to carry the effect beyond the second degree, however long it might be continued; and this accounted for the failures which had occurred in administering the chloroform,—for, if from the face-piece not fitting, or from any other cause, the vapour became diluted below this strength, no amount of its consumption would produce the desired effect.

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on gout, it affords a motive for similar treatment in a similar case. The pulse of this gentleman, I may observe, was naturally slow: I carefully modified the dose of colchicum, so as not to depress it below its normal standard, to which depression it was prone under any increase of the doses.

This use of cases is, in truth, a philosophical empiricism; and the instances which I have given strengthen the importance which I have attached on other occasions in this journal to a record of single cases. Our medical literature requires, indeed, a larger stock of single cases or monographs, not only in this empirical point of view, but as embodying the varieties of nosological generalisations, so as to afford the modifying influences of constitution, temperament, &c. by observance of which our treatment is individualized, and the idiosyncrasies of the patient receive attention. How unimpressive, and therefore uninstructive, are the "varieties" of Sauvages, stated, as they are, in the abstract! and how immediately would they be vitalized if his diagrams were changed into portraits! Meanwhile we accumulate, in our reports, expections, and not examples, as if a perfect acquaintance with the latter ought not to precede an enumeration of the former.

It may be alleged, with slight show of reason, that cases expressing all these varieties would be interminable, and might mislead us out of the more philosophical road to successful practice—that, namely, which lies through general principles. I have already suggested that facts are, after all, the medium through which we apply, as well as construct, our general principles; but I may further assert, that principles can be applied through no other medium; and that all practice is resolvable into the application of a fact conceived or remembered, however large or limited may be the principle which the fact illustrates. Let him who doubts this remark test its accuracy by examining the operations of his own mind, as applied to a new case. The place assigned to it by nosology will not satisfy him; he views it by the light of his experience—in other words, he determines its pathology and treatment either in direct reference to some other cases, or with a tacit recognition of the kind of practice which a similar case has before required; and thus, while he is applying the general principles of classification, he tacitly, if not overtly, assigns to the case those specific differences which separate it from other cases of that class. A time, no doubt, arrives with most men, in which practical conclusions are arrived at with a rapidity which defies such analysis; but their character is not therefore lost, because its manifestations have become too rapid for observation. And it is expedient to give the medical mind that pabulum through well-recorded facts, which may be digested, as it were, into such conclusions. With respect to these empirical stores becoming oppressive, no apprehension need be entertained on that score. At present, for want of such records, the *normal* is but partially known; and we are constantly finding ourselves in a false position, as apparent discoverers of new facts, which are perhaps only crude expressions of what have been previously accredited and forgotten, *carent quia vate.*

The functions of single cases, which I have endeavoured to elucidate, will appear yet more important, when it is recollected that there are diseases recognized in nosology, in respect to which our knowledge is at present so far inchoate as only to exist in the shape of examples: in which no general expression of their character can be made,—no diagram can be offered; and we must be contented to recognise the disease in its portraits—that is to say, its cases. Thus, in hysteria, there is no generalization on the subject of it which advances us a step; no description of it, except such as is embodied in cases, will enable us to deal with it in practice. And I believe it remains one of the *opprobria medicinæ*, mainly because we are not sufficiently aware of that fact, and have not sufficiently enriched our records with monographs indicating its varieties. I know no work on hysteria which is so useful, because it is thus enriched by cases, as that of M. Louvet Villermay.

The fact that many practitioners make a bad use of cases, and convert their experience into a source of error, is unquestionable. A generic, instead of a specific affinity, is often accepted, as justifying the use of the precedent; nay, there are practitioners whose measures can generally be traced to the *last* case of the disease that they have seen. It is hoped that the above remarks may tend to prevent this abuse of observation, by pointing out the real value of the ομμα της εμπειριας.

[To be continued.]

LOCAL ANÆSTHESIA;

NOTES ON ITS ARTIFICIAL PRODUCTION BY CHLOROFORM, &C., IN THE LOWER ANIMALS AND IN MAN.

By J. Y. Simpson, M.D. F.R.S.E.
Professor of Midwifery in the University of Edinburgh.

A few months ago I published some remarks, with the object of proving that the artificial production of a state of *general* anæsthesia before the performance of surgical operations, was not altogether an idea of modern times.* I shewed that Pliny, Apuleius, and other early writers, aver that such a state of general anæsthesia can be produced by using mandragore; and that, in the 13th century, Theodoric had published a receipt for producing it, by the inhalation of vapours arising from the watery extracts of various narcotic herbs. In our own days, this receipt of Theodoric's, or one apparently analogous to it, has been apparently found quite sufficient for the purpose, by Dauriol.

The ancients seem also to have entertained the idea of the possibility of producing a state of *local* and limited anæsthesia in any part to be operated upon. Dioscorides, who repeatedly mentions the production of general anæsthesia by mandragore, states it, as a matter of report, that local anæsthesia in a part was capable of being produced by the application of the Memphian stone. "The Memphis stone," says he, "is found in Egypt, near Memphis, of the size of a calculus, fatty, and of different colours. They say that this, when bruised and spread over parts that are to be cut or cauterized, without danger so obtunds their sensibility that they do not feel pain."† (Hoc tradunt trito et illito partes quæ urendæ vel secandæ sunt citra periculum ita obstupescere, ut non sentiant cruciatum.)

Whilst we may entirely doubt that local anæsthesia was capable of being produced by such an apocryphal application as the above, the passage is curious, as evidence that the idea of obtunding a single part of the body against the pain of an operation was not unknown or unthought of in former times. Nay, many old authorities believed, that against the fire ordeal any part of the body could be so protected and defended, by previous applications, that the human hand, for instance, should not feel the contact of the red-hot iron. The writings of Eusebe Salverte and Beckmann contain ample notices on this disputed question. Upwards of half a century ago, Dr. Moore ingeniously proposed to effect a local anæsthesia of any limb that was to be operated upon by the surgeon, by previously compressing, with tourniquets and pads, the nervous trunks going to that limb; and he has left us one interesting account of a case of amputation at St. George's Hospital, in which the plan was tried, seemingly with partial success, by John Hunter.

The possible production of local anæsthesia by this or other means is certainly an object well worthy of study and attainment. Surgeons everywhere seem to be more and more acknowledging the facility, certainty, and safety, with which the state of general anæsthesia can be produced at will, before operating; as well as the moral and professional necessity of saving their patients from all unrequisite pain. But if we could by any means induce a local anæsthesia without that temporary absence of consciousness which is found in the state of general anæsthesia, many would regard it as a still greater improvement in this branch of practice. If a patient, for instance, could have his hand so obtunded that he could *see*, and yet not *feel*, the performance of amputation upon his own fingers, the practice of anæsthesia in surgery would in all likelihood advance, and progress still more rapidly than ever it has done.

In the following remarks it is my object to state the results of a number of experiments which I have performed (1), upon the lower animals* and (2) pon man, with a view to the possiility of the production of such a state f local anæsthesia, by the local appliation of chloroform and other anæshetic agents to individual parts of the ody.

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* Monthly Journal of Medical Science, vol. 1847-8, p. 451.

† Dale's Discoridis Opera, lib. v. cap. 158.

* Through the kindness of Professor Balfour I have had various opportunities of trying the effect of chloroform vapour upon the sensitive plant (*Mimosa Pudica*). When the vapour was

I.—*Local Anæsthesia in the lower animals.*

At a meeting of the Medico-Chirurgical Society of Edinburgh, held on he 17th of March, I took occasion to tate that I had successfully chloroormed several of the lower animals—nnelida, crustacea, fishes, &c.; that in ome, and more especially in the common earthworm (Lumbricus Terrestris), I had been able to produce local anæshesia by applying the chloroform apour locally; and had thus at will endered anæsthetic, individual parts nd portions of the worm, as the head merely, or the tail merely, or the middle part of the worm merely, the head nd tail remaining unaffected. At the ame time I recapitulated what I had tated at one of the February meetings f the Society—that, in the human ubject, local anæsthesia of a portion f the gums could be produced by rubing the part with hydrocyanic acid. After the date of the above meeting I as led to make some additional exeriments upon the possible production f local anæsthesia in man; and in eporting the proceedings of the preeding sederunt of the Society, in the ast number of the Monthly Journal of Medical Science, the editor has stated, n a short foot-note, some of the results f these experiments upon the human ubject.*

Nothing could be more curious or atisfactory than the experiments aluded to, on the production of local næsthesia by the local application of hloroform vapour to different parts of he body of the earthworm. The reulting degree of local anæsthesia in he part exposed is generally in the course of two or three minutes most complete as regards both sensation and motion. In fact, after being sufficiently exposed, the chloroformed portion of the animal is quite flat and flaccid, does not move under any irritation, and can be doubled and twisted up upon itself like a piece of loose wetted cord. If the part paralysed by the chloroform is small, it will be dragged along by the movements of the other unaffected portions of the worm. It generally, in the course of a few minutes, gradually regains its powers of motion, and its irritability and contraction, under stimuli.

The easiest method of performing this experiment is to place a small quantity of chloroform in the bottom of a tumbler, paste over the mouth of it a covering of paper, and making an aperture in this covering sufficient only to admit the portion of the animal that is to be chloroformed. When held in this position, the part of the animal below the paper, and exposed to the vapour of chloroform, is generally thrown into violent movements for a minute or two before the state of anæsthesia supervenes. I have repeated the same experiments with the vapour of sulphuric ether and bisulphuret of carbon.

I have tried the same experiment, with the same result, upon the medicinal leech.

The results were, if possible, still more marked in another of the Articulata that was submitted to experiment. A small centipede (Julus Sabulosus?) was rendered completely anæsthetic and motionless in the posterior segments of the body, by exposing that part alone, for a few minutes, to the vapour of chloroform. The five or six last rings of the centipede, with the suspended and motionless feet attached to them, were for a short time afterwards dragged about in a kind of paraplegic state, and by the brisk and lively movements of the anterior and not anæsthetic portion of the animal. Betimes, however, each segment, with its corresponding feet, regained its power of motion; and this in regular order, from before backwards. In the same and in other centipedes I have produced perfect local and limited anæsthesia of the head alone, or of individual segments and portions of the body alone, by brushing these parts with liquid chloroform.

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ither too strong or too long continued, the plant as destroyed. When it was weaker, and aplied only for a few minutes, the leaflets in some lants closed as when irritated, and did not exand again for an unusual length of time. In ther plants under exposure to the chloroform apour, no closure of the leaflets took place, and, n a few minutes, the plant became so anæstheized, that the mechanical or other irritation of he leaflets or stalk did not produce any of the ommon movements; nor did their irritability ecome restored for a considerable time afterards.

* See Monthly Journal, No. xci. p. 48.

By immersing the tail of the water-newt in chloroform vapour, the sensibility and motions of that part were rapidly destroyed, and returned a few minutes afterwards. By a longer degree of immersion of the tail alone, the whole animal became anæsthetic; and in several experiments it was found possible, but difficult, to give the animal in this way a fatal dose of the vapour.

The hind-leg of the frog becomes anæsthetic when exposed for four or five minutes to the vapour of chloroform. Immediately after, it drags the limb in progressing; and bears, apparently without feeling, pricking and irritation of it; but a galvanic current passed through it excites both sensation and motion. In one case the motory power of the limb was not completely restored at the end of the third day. No effect appeared to result from keeping the hind-leg of the frog immersed in strong tincture of Indian Hemp.

The hind-leg of a healthy active rabbit was confined in a large bladder containing the vapour of chloroform. At the end of an hour, the common sensibility of the limb to pinching and squeezing was much impaired; but still, a current of galvanism, passed from side to side through it, produced crying and signs of pain. The power of moving the limb seemed unimpaired.

The hind-leg of a guinea-pig, similarly treated, exhibited the same phenomena at the end of an hour; but the anæsthesia was more complete. The skin of the leg was red and congested.

The posterior extremities and pelvis of a strong guinea-pig were enclosed in a bag containing the vapour of chloroform. At the end of an hour no signs of pain could be extracted by pinching and squeezing either limb; and a current of galvanism, passed through a hind-leg, evidently caused much less pain than when the same current was passed through a fore-leg. The whole hinder parts were very red and congested. The animal was also in some degree paraplegic; and dragged itself along, by strong efforts, with its anterior limbs.

In a late number of the Gazette, Mr. Nunneley, of Leeds, has published some interesting remarks on the subject of the artificial production of local anæsthesia.

Mr. Nunneley states that chloroform and other anæsthetic agents can, he believes, be applied locally to a part to produce local anæsthesia; the sensorium being unaffected, consciousness being retained, and the limbs and other parts not subjected to the action of the anæsthetic agent, retaining their usual æsthetic condition. His opinions regarding the supposed value and safety of this new mode of administering anæsthetic agents had been formed by Mr. Nunneley on the results of experiments. By the local application of chloroform to the limbs of frogs and toads, and the hind legs of rabbits, he had rendered these parts anæsthetic, and he obtained, (he states), similar results in the human subject, from keeping his finger immersed in anæsthetic fluids for half an hour or an hour; and in one case where the operation for artificial pupil was to be undergone, he had, (he mentions), rendered the parts nearly insensible, by applying to the eye for twenty minutes previously a small quantity of the vapour of chloroform. This naturally leads us on to the consideration of the second and most important subject—viz. the artificial production of—

II.—*Local Anæsthesia in the human subject.*

In a previous paragraph, I have already alluded to some experiments on the production of local anæsthesia in the gums, by rubbing them with prussic acid. Early in the present year I was led to make a variety of experiments on this subject, in consequence of being assured, on what I believed to be satisfactory evidence, that a dentist at Limoges, in France, M. Pernot, had the power of extracting teeth with little or no pain, in consequence of previously rubbing some obtruding agent on the gums. I tried at the time a great variety of substances in order to obtain this local anæsthesia; such as various æthers, bisulphuret of carbon, benzin, aconite, &c. Among all the agents employed, the effect of prussic acid was the most decided and complete; any part of the gum strongly rubbed by it speedily became benumbed and insensible, but the resulting degree of anæsthesia was by no means sufficient for the purpose required. The results of these experiments were stated orally to the Edinburgh Medico-Chirurgical

Society, at their meeting on the 16th February.

Before that date I had met with one instance in which local anæsthesia of the human hand had been produced in a young lady, in consequence of her accidentally holding in it for a considerable time a scent-bottle containing some chloroform. I tried at various times to produce a similar result in myself, and in others, by keeping a hand wrapped in a napkin soaked in chloroform and other anæsthetic agents, but with little or indeed no appreciable success, till I used the vapour of chloroform raised by heat; the hand, for the purpose, being immersed in a deep jar in which a small quantity of chloroform was poured, the jar placed in a basin of water, of the temperature 150° or upwards, and the wrist or forearm being at the same time surrounded by handkerchiefs, so as to prevent the escape of the vapour. In the last number of the Monthly Journal, (p. 48), these experiments are noticed; and it is correctly stated that the degree of local anæsthesia of the human hand which I have been thus able to produce, is only "partial, and perhaps superficial."

A number of circumstances influence, however, the effect and the degree of it; and as I have made a considerable variety of experiments both upon myself and upon others, in order to ascertain these points, I will shortly state the results. Let me premise, that in the experiment upon which the following results are founded, the hands of the same individual were generally held simultaneously in two different jars, differently arranged in regard to material or otherwise, in order to make two different and comparative experiments at the same time; and the relative degree of anæsthesia in each hand was ascertained during the experiment by pricking the fingers with the thumb-nail, without removing the hand from the jar; after they were removed, these and other more severe measures were used with the same view, as tests of the degree of anæsthesia.

1. When the hand is exposed to an anæsthetic vapour, especially if it is raised by heat, it betimes presents the sensations of a limb benumbed by compression of its larger nervous trunks: the sensations, in fact, of partial paralysis. Usually, after a short time, a glowing or burning feeling is perceived in the parts most exposed, and gradually there supervenes a sensation of thrilling and tingling (like a limb asleep), which deepens more and more. The skin becomes red, and the hand at last feels stiff and clumsy, and as if enlarged; and painful impressions, as pricking, pinching, &c., are felt less acutely. After the hand is removed from the vapour, it is generally half an hour or more before its usual feelings are restored. The nerves of motion are usually, apparently, as much affected as the nerves of sensation.

2. The vapour of chloroform proved stronger than any other that was tried. When one hand, for instance, was immersed in a jar containing the vapour of sulphuric ether, and the other hand in a jar containing the vapour of chloroform, (both jars containing similar quantities, and subjected to the same degree of heat), the hand in the chloroform jar was both more speedily and more deeply affected than the other. In addition to the vapour of chloroform and ether, I tried comparative experiments with the vapours of aldehyde, bisulphuret of carbon, iodide of methyle, &c. The aldehyde had little or no effect of any kind. The iodide of methyle produced a very severe burning sensation, and left the hand intensely red for a day or two afterwards, but with no marked anæsthetic influence. Among several of us that tried the vapour of bisulphuret of carbon, only one bore it for any great length of time, (about an hour), and in him it did not render the hand anæsthetic in any very appreciable degree; in myself and others, the sensation of heat and burning soon became so utterly intolerable, as to force us to withdraw the hand. Immersion of the hand for half an hour in very strong tinctures of aconite, opium, and Indian hemp, and in solution of belladonna, produced no very appreciable local anæsthetic effect.

3. The anæsthetic effect is increased both in rapidity and in degree by immersing the hand with the cuticle softened and moist. When one hand, for instance, is immersed without any preparation, and the other is prepared by being bathed and fomented for ten or twenty minutes previously, the limb almost immediately begins to tingle

under exposure to the vapour—the dry hand not for some minutes. The degree of anæsthesia is also ultimately deeper in the moistened hand. Immersion of the hand in warm water alone for ten or fifteen minutes produces a very marked degree of local anæsthesia in it. Exposure of it in the same way to ice-cold water leads to the same result, but is too painful to be long borne.

4. The hand, when plunged in liquid chloroform, is usually somewhat more deeply apathized than the other hand simultaneously held in the vapour of chloroform. This was the more general result with those who tried the experiment; but in some the chloroform vapour was as anæsthetic, or more so, than the liquid. Few persons can keep the hand for any adequate length of time in liquid chloroform; the sensation of burning becomes so intense and painful, as to force them to withdraw it in a very few minutes. On one occasion, I held my hand for upwards of an hour in liquid chloroform, without the part being more apathized than it would have been by exposure to the vapour. One of my pupils, Mr. Adam, held his hand in the liquid chloroform for upwards of two hours: no great degree of local anæsthesia resulted. In those cases in which the hand was long steeped in liquid chloroform, the sensations of burning returned severely from time to time, as if in waves, during the experiment; and on removing it from the jar, the feelings of heat were temporarily aggravated. The normal sensibility of the parts speedily returned, and were completely restored within a few minutes in all. But the skin sometimes remained red and injected for a longer period.

5. The degree of delicacy of skin in the person or part exposed to the anæsthetic vapour influences the result. In females I have seen the degree of local anæsthesia of the hand that was produced much greater and deeper than I could ever render it in the male subject. In applying the chloroform vapour in small cupping glasses, &c. to different parts of the body, as the insides of the arms, &c., the resulting degree of local anæsthesia seemed in a great measure regulated by the tenuity of the skin of the part experimented upon. The skin of the axilla seems too tender to allow of the vapour being applied for a length of time sufficient to produce anæsthesia. One of my students, who kept both his lower extremities enveloped in strong chloroform vapour raised by heat, for three continuous hours, felt no appreciable local anæsthetic effect from it.

6. When strong chloroform vapour is locally applied to mucous surfaces, the attendant sensations of heat and smarting are too severe to allow of its sufficient continuance: at least, this is the result that I have obtained in applying it with small glasses to the insides of the lips, the tongue, and eye. Mr. Nunneley states, as we have already mentioned, that before operating on a difficult case of artificial pupil, he had applied for twenty minutes a small quantity of the vapour of chloroform to the eye by means of a small jar which accurately filled the orbit, with the effect of rendering the parts nearly insensible. Dr. Duncan and I have several times tried to repeat this experiment upon ourselves, but in none of the trials which we made (with the eye either shut or open), could we endure the burning action of the vapour upon the part above two or three minutes; and we found no other result except always rendering the eye experimented on red and injected, and suffused with tears.*

7. The degree of anæsthesia produced in a limb by exposure of it to the strong vapour of chloroform, does not, in general, perceptibly increase

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* I have tried the application of various anæsthetic gases and vapours to the vagina, in cases of vaginal irritation and neuralgia; but hitherto without much success. The stronger forms cannot be borne. I was induced to try them in consequence of the following curious statement regarding carbonic acid, published by Pereira, (Materia Medica, p. 155):—

"A lady, who had suffered for a considerable time from some uterine affection, and had derived no relief from the treatment adopted, was advised to consult a physician in Italy (Dr. Rossi). After he had examined the condition of the uterus, he assured her that there was no organic disease, but merely a considerable degree of irritation, for which he proposed to apply carbonic acid as at sedative. This was done by means of a pipe and tube, communicating with a gasometer situated in another room. The patient obtained immediate relief, and although she was obliged to be carried to the doctor's house, on account of the pain experienced in walking, she left it in perfect ease. On her return to England she had a relapse of the complaint, and applied to Dr. Clutterbuck to know whether she could have the same remedy applied in London, in order to save her the necessity of returning to Italy."

after fifteen or twenty minutes. The same sensations continue if the hand is still retained in the jar; but an increased length of exposure does not, after a time, produce a corresponding degree of local insensibility.

But the degree of local anæsthesia produced in the human hand or skin by exposing it to the local action of the vapour of chloroform, has never, in my experiments, been by any means so perfect and complete as to annul the pain of any severe operation, such as deep incisions or amputation of a finger. As compared with the other non-exposed hand, the chloroformed hand is generally rendered to a marked amount *less* sensitive; but the insensibility is never, I fear, so deep and perfect as will save the patient from the pain of the surgeon's knife. In short, I entirely doubt whether in the human subject we shall ever be able to reduce the knowledge of the possible reduction of local anæsthesia to any practical purpose. It is principally interesting in a toxicological and physiological point of view, and in relation to the mode of action of anæsthetic agents.* Its bearings are more upon the theory than upon the practice of anæsthesia.

These remarks relate necessarily to local anæsthesia as capable of being produced by the anæsthetic agents with which we are at present acquainted. Others may, no doubt, yet be detected much more powerful than any we at present know, and their local application may enable us to effect the local anæsthesia desired. At the same time, this consummation, even, seems doubtful; for perhaps any agent possessing a deeper and more rapid anæsthetic local power, would, by absorption, affect the system generally, it may be dangerously, before complete local insensibility of a part could be effected. Some time ago, in attempting to produce local anæsthesia in my hand by exposing it to the vapour of hydrocyanic acid, ere the hand was much or very perceptibly benumbed, I began to feel the constitutional effects of the poison: my respiration became irregular, and I felt giddy and faint, when my assistant removed my hand from the jar. All due care was taken to prevent me breathing any of the vapour, and I sat during the experiment in a current of air. I felt the benumbing influence of the acid extending from the hand upwards along the arm a minute or two before the experiment was stopped.

I have tried the long immersion of the hand in various gases, as carbonic acid and common coal gas (both of them powerful *general* anæsthetics when inhaled), without any effect. Chaptal, however, alleges that he had felt the limbs plunged in carbonic acid much benumbed; and Collard de Martigny found, that, when the general surface of his body was immersed in carbonic acid (arrangements being made that none of it was breathed), giddiness, ringing in the ears, and the other symptoms produced by the action of this gas, supervened in eight or ten minutes, proving that it was absorbed. Davy felt the premonitory exhilaration of nitrous oxide gas by exposing the surface of his body to it in the same way.

Chaussier inclosed the leg of a dog in a bag containing sulphuretted hydrogen, and found that he could in this way in a few minutes induce the poisonous effects of the gas; and similar experiments were repeated by Lebkuchner and Nysten, and my friend Dr. Madden, on the rabbit, &c., with similar results. I have held my hand enclosed in a bag filled with the constantly renewed vapour of sulphuretted hydrogen for above half an hour, without feeling any local effects.

The facts which I have stated seem, in the present state of our knowledge, to point to the following

Conclusions.

1. In animals belonging to the class Articulata, complete local and limited anæsthesia can be produced by the local and limited application of the vapour of chloroform to individual parts of the body of the animal.

2. In batrachian reptiles, the tail

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* Perhaps we will be less surprised at the difference in the degree of local anæsthesia capable of being produced in the lower animals, as compared with man, when we recollect the difference that exists between the structure and functions of their skins and that of the human subject. "In animals whose skin is moist, and which possess a very delicate cuticle, cutaneous absorption is a constant and important function. Such are frogs, salamanders, and similar animals. The experiments of Edwards have established the skin in them to be entirely absorbing, and instrumental in their support." (See Jackson on Absorption, in American Cyclopædia of Practical Medicine, No. II. p. 115).

or an individual limb can be affected in the same way with local anæsthesia; but, in addition, general anæsthesia of the animals usually results in a short time, by the action of the chloroform absorbed through the exposed part.

3. In the smaller mammalia, a single limb, or even the lower or pelvic half of the body, can be rendered anæsthetic by local exposure of these parts to the influence of chloroform.

4. In the human subject, local anæsthesia of a part, as the hand, can be produced by exposing it to the strong vapour of chloroform; but the resulting degree of this local anæsthesia is not sufficiently deep to allow the part to be cut or operated upon without pain.

5. Any agent possessing a stronger local benumbing or anæsthetic influence would probably be dangerous, by its acting on the general economy before the local anæsthesia was established to a depth sufficient for operating.

6. Artificial local anæsthesia from any known anæsthetic agents seems objectionable in any part intended to be operated upon, in consequence of the vascular congestion and injection which attend upon and result from this local anæsthesia.

7. There are few operations in which there is not previously a broken surface, and the application of chloroform, &c., to such a surface would be far too severe to be endured; their application to the unbroken healthy skin being usually attended with considerable pain.

THE CORNEA NOT CONCERNED IN ADAPTING THE EYE TO VISION AT DIFFERENT DISTANCES.

The increased convexity of the cornea, which was said to be one of the important changes effected by compression of the eye, and on the occurrence of which its power of adaptation to the perception of near objects was supposed to depend, could not be detected by Hueck. He attentively watched the cornea while the sight was changed from an object thirty feet distant from the eye, to one only seven inches distant, but beyond the movements resulting from respiration and from the pressure of the orbicularis muscle, he could not perceive any change in the cornea; no protrusion, and no sinking. This agrees with the observations of Dr. Young, who also was unable to perceive any such change as was said by Sir E. Home and others to take place.—*Baly and Kirkes's Recent Advances in Physiology.*

MEDICAL GAZETTE.

FRIDAY, JULY 14, 1848.

We elsewhere report two cases of death from the inhalation of chloroform vapour,* the one having occurred in the United States, and the other quite recently in this country. The unfortunate case of Mr. Badger is sufficient to shew that even they who are most experienced in the use of this agent, are not always able to discriminate those cases in which the inhalation of the vapour is likely to be attended with fatal effects. The deceased was a healthy muscular young man, who, according to the testimony of his father, had suffered from no difficulty of breathing, or any other apparent disease. The inspection of the body, however, revealed a diseased state of the heart and liver, although not sufficient to account for sudden death. Hence we arrive at the conclusion that a young and healthy-looking person, whose appearance and previous habits of life would create no suspicion of the existence of latent organic disease, may still be in such a condition of body that the respiration of the vapour will operate upon him like a fatal poison. It is not here as with a liquid or solid taken into the stomach,—the poison enters at once into the circulation, and penetrates through the whole of the system; and but a few minutes elapse between apparently perfect health and the death of the patient. The circumstances under which the poison is administered, do not, in these unfavourable cases, admit of the application of any remedy. The attempt to abstract blood has uniformly failed.† Art is powerless in dealing with the poison-us effects of this vapour. It may be aid, and we doubt not the truth of he statement, that hundreds, nay housands of persons, young and ealthy-looking like the deceased, have nhaled this vapour without any such isastrous effects following. We have, owever, heard of some very narrow scapes, even where precaution and kill of the best kind had been em- loyed in its administration; and loubtless the experience of many of ur readers will furnish them with ases corroborative of this remark. ut the death of only one person in a housand, when the vapour has been kilfully administered—and there was othing in the patient's aspect or ccount of himself to induce the ope- ator to withhold his consent to its em- loyment—becomes a most serious mat- er. There should be some extraordinary dvantage or benefit to the individual o justify such a fearful risk; but the dvantage, if any, in reference to the lental art, is the alleviation of pain nerely for a few minutes; and the aked question now to be considered s, will any operator feel himself justi- ied, after the case of Mr. Badger, in mploying this dangerous vapour for he annulling of pain in the extrac- ion of teeth? If latent disease of the eart or liver could always be clearly liagnosed in a patient, we should not e called upon to put this question: ut as Mr. Badger's case proves that a nost experienced man like Mr. Robinson saw nothing about the deceased o justify his refusal to employ chloro- orm, it is clear that the most skilful lentist may be working in the dark, nd thus unconsciously be the means f sacrificing life for the sake of umouring a patient by annulling a legree of pain which every healthy dult should be able to bear. The acts of this case have, however, a bear- ng far beyond dentistry. We consider that our remarks apply to all the minor operations of surgery; and judging by an extract of a letter elsewhere inserted,* Dr. Meigs, a transatlantic physician of some repute, holds a similar opinion in respect to the use of chloroform in obstetric practice.

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* Pages 77 and 79.

† See the cases reported by Dr. Meggison and Dr. Jameson, in our last volume, p. 250 and p. 318.

We have been arguing the question as if the deceased had died from the effects of chloroform vapour. We think, indeed, that the facts speak for themselves, and justify the verdict of the jury. There was no asphyxia here; it could not be supposed that the deceased died from the effects of treatment, as it has been suggested in other cases; nor can it be insinuated that the chloroform was administered in an improper dose, or in an improper manner. To attribute unskilfulness to Mr. Robinson, would be unwarrantable; in his evidence he states that he has administered the vapour in at least three thousand cases, so that the advocates, if there be any, of the perfect harmlessness of chloroform vapour, must fall back upon the hypothesis of death from natural causes occurring at the time by a sort of special coincidence. We do not believe, however, that this view will be seriously adopted. It will not benefit the ultra-chloroformists; while the public and the unbiassed portion of the profession will be led to think, that on all these occasions of fatal effects following its use, there is a desire to conceal or distort the facts, so that alarm may not be created.

It appears from the evidence, that Mr. Robinson employed on this occasion one drachm and a half of chloroform: this is about the usual dose. The inhaler was not held close to the mouth or face, and deceased had not inhaled more than a minute, when it appeared to have produced so slight an effect, that he requested to have the vapour made stronger. Before this could be done, however, the head and hand of the deceased dropped — *i. e.* in one second after he had spoken to the operator. A period of about *five minutes* elapsed from the time at which the deceased entered the surgery to his death.* When seen by Dr. Waters immediately afterwards, the face was livid, the pupils were dilated, and the temperature of the body was lower than natural. There was general congestion of the membranes of the brain, and of the surface of the corpora striata and optic thalami. "The lungs presented a little sign of congestion." These are the chief appearances indicative of the action of chloroform. The great difference in this and the two other cases to which we have referred, consists in the lungs being much less congested. The fatal effects of the vapour, however, came on quite suddenly in the case of Mr. Badger, but more slowly in the cases reported by Dr. Meggison and Dr. Jameson. This may perhaps account for the discovery of a smaller amount of congestion in the lungs. On the other hand, the liver was much enlarged, and the heart diseased; but the morbid state of these organs was not such as to explain the sudden death, under the circumstances, irrespective of the action of chloroform vapour. We consider it to be an irresistible inference from the facts of the case, that but for the use of chloroform the deceased might now have been living; while, on the other hand, it is highly probable that, but for the existence of disease in the heart and liver, the chloroform vapour would not have proved fatal. With these admissions there can, we apprehend, be no doubt that the inhalation of the vapour was the immediate cause of death.

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* Page 85.

The most startling features of this case are, that a person may very suddenly die from the effects of the vapour, without the occurrence of any one warning symptom to indicate the near approach of death; and that the vapour will prove fatal in cases which may appear to be perfectly favourable to its administration.* Mr. Wakley, the coroner, very justly remarked, in his summing up at the inquest, that—"The appearance of perfect health displayed by this gentleman, and the youthful glow which brightened his countenance, were well calculated to lull any suspicion that there existed the great amount of derangement of structure which had been described by the medical witnesses." This remark should be borne in mind by all who may hereafter employ chloroform vapour in minor surgical operations. It is obviously not always in the power of the operator to judge from the aspect of a patient whether he may or may not safely use the vapour; and if among a thousand patients who inhale it only one should die, it is really a serious question whether the risk can justify the transient benefit derived from the state of anæsthesia. Every practitioner, before resorting to its employment hereafter, should, we consider, put to himself the question proposed by Dr. Meigs—"What sufficient motive have I to risk the life or the death of one in a thousand in a questionable attempt to abrogate one of the general conditions of man?"

Since these remarks were written, we have introduced into our columns two other cases of the alleged fatal the metropolis. This fact shewed that some other causes for the prevalence of a disease in an hospital, besides bad ventilation and washing the floors, must exist; for in the fever hospital these two causes were not in operation; neither did he think that diseases like erysipelas and phlebitis were more prevalent in hospitals than out of them; for he had admitted many.

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* In Greener's case a drachm of chloroform was used, and the death of the patient took place in three minutes. See our last volume, p. 251.

* Mr. Robinson advised the deceased not to take the vapour, as the dental operation would occupy but a short time. It does not appear that this advice was given from any doubt in the operator's mind that chloroform could not be safely administered, or it is quite certain that a man of Mr. Robinson's experience and professional knowledge would not have yielded to the caprice of a patient.

Cases illustrative of some consequences of Local Injury. By Thomas Hodgkin, M.D.

The cases detailed are divided into two groups: the one, in which the effects had more or less the character of common inflammation; the other, distinguished by the production of an adventitious structure having the character of malignant disease. The following is an outline of the first of three cases included in the former group:—

R. M——, about forty-five years of age, an active man of business, of spare habit, but enjoying nearly uninterrupted health, had, rather more than two months before his death, fallen upon the edge of the kerbstone in one of the streets of London, but was not sensible of having received much injury. About six or seven weeks afterwards he was exposed to wet and cold, after being heated and fatigued. In the evening he was chilly and distressed, and felt severe pain in the right side. He went out the next day and was again exposed to wet and cold, but after this was confined to the house. A blister was applied to the seat of pain, and aperients and effervescing salines were given. He complained no more of pain in the side, but remained feverish and weak. Two half-glasses of claret produced a most disproportionate mental excitement, which returned in paroxysms. In a day or two after this he passed into a state of coma, with very rapid, feeble pulse. Ammonia was given. He revived, and complained transiently of a little pain in the left arm and leg. A small induration was found near the calf of the leg: this slowly increased, and the day before his death caused considerable pain. After the mental disturbance had passed off, his head was generally hot, and his face for some time rather flushed; the expression of his countenance generally quite composed; the breathing quick, but easy, with a little stertor during sleep or somnolence; the tongue was moist, with a white fur on its surface; the pulse generally numbered 120; vomiting occurred twice or three times before death. A short time before death small pustules or maturating vesicles were noticed on the body and limbs.

On the examination of the body, a small subcutaneous collection of pus was found near the head of the right fibula. A larger tumor at the upper part of the left calf was not opened. Nothing remarkable was found within the cranium, except that in the cortical substance of the brain, at one particular spot, there seemed to be an evident but very partial softening, by which the separation of the external layer of the cortical substance from the subjacent layer was favoured. The right pleura presented marks of recent inflammation near its lower part, and over the fifth or sixth rib, from its anterior extremity to its angle, was elevated by rounded purulent deposits of various sizes. The corresponding part of the pulmonary pleura presented similar purulent deposits, and the adjoining part of the lung was in a state of recent hepatization. The muscular structures on the exterior of the same rib were found sprinkled with similar, but smaller purulent deposits. The left pleura and lung, and the heart, were healthy. In the abdomen, the only remarkable appearances were numerous scattered depressions in the mucous membrane of the stomach, probably the enlarged orifices of follicles, marks of severe inflammation of the mucous membrane of the large intestine from the middle of the arch of the colon to the rectum, and the presence of a small quantity of semi-transparent lymph between the convolutions of the intestines—between the middle and lower parts of the abdomen. Of the second class of cases seven examples are given. The author, in his remarks, first directs attention to the peculiarities of the former class of cases; the slight primary effects of the local injury, and the anomalous character of the secondary effects; the disturbance of the mental faculties in two of the cases; the constitutional disturbance, exciting the suspicion that the brain, heart, or some important part of the alimentary canal, was in a state of acute inflammation; and in two cases, the severity and rapidity of the symptoms, which were nearly as great as in cases of dissection and other poisoned wounds. He expresses the opinion, that these symptoms were due to a morbid poison being generated in the system—an opinion favoured by the occurrence of vesicles, with puriform contents, on the surface of the body. To explain the formation of this morbid poison, he supposes that the immediate effect of the local injury is so to impair a portion of the animal tissue, as to render it incapable of the proper maintenance of those molecular changes by which interstitial absorption and deposition are carried on; that the changes which take place in dead animal matter proceed in the injured part very slowly, and during health produce no inconvenience; but that if a febrile state of the body be set up by cold or other cause, the morbid influence of the part in which these chemical changes are going on, produces inflammation or derangement of a more specific kind in the surrounding tissues, and the further production of a like cause of irritation in the system generally. In one case a remarkable odour of malt or saccharine matter was observed. This the author regards as an almost certain omen of death. In the second group of cases, instead of the vitality of the injured part being reduced, the most striking phenomenon is the production of a new growth, to which vital organization is essential. All living parts, whether old or new, are nourished from living material, and every living cell is produced from a previous cell. In these cases the injury does not destroy life, but only modifies the nutrition of the part, by exerting an influence on small molecules. The result is, that the new cells formed there are modified, from being, as it were, incubated in a peculiar *nidus*. When once the production of morbid corpuscles, suited to the production of a morbid tissue, has taken place, the growth of such structure at the affected part may also be made the subject of ocular demonstration; but the subsequent appearance of a similar structure in other parts of the body, is still involved in some mystery. The author explains his own views on this difficult question.

ACADEMY OF MEDICINE.

July 4.

Death from Chloroform in France.

At the Meeting of the Academy of Medicine on the 4th of July, the following instance of the fatal effects of chloroform vapour was communicated to the members by M. Gorré, Surgeon-in-Chief to the Hospital of Boulogne.

The patient was a female about 30 years of age; and the operation which was performed on her under the use of chloroform vapour, was merely that of opening an abscess caused by a foreign body lodged beneath the skin. Before commencing the operation, M. Gorré held under the nostrils of the patient a handkerchief on which he had poured about *fifteen* or *twenty drops* of chloroform. The patient had only made a few inhalations, when she cried out, "I am suffocating." Her face became pale,—the expression of her countenance was changed, the respiration was difficult, and there was frothing at the mouth. The handkerchief was withdrawn, and the operation was performed. During its performance, which occupied a very short time, one of the assistant-surgeons endeavoured to restore the patient from the state of inanimation into which she had fallen. M. Gorré and his assistants persisted for two hours in the use of every possible means to rouse her; but their efforts were vain. They could hardly persuade themselves that she was dead, although it is most probable that she died about the time at which the operation was commenced. The author compared the suddenness of death to that state in which the individual dies from the introduction of air into the veins.

There is but a very meagre account of the post-mortem examination. A quantity of air was found in the veins, especially in those of the brain and at the base of the skull, as well as in the pulmonary, hepatic, and crural veins. The blood was *remarkably dark, and very fluid; in colour, it resembled ink.*

M. Gorré referred death, first, to the poisonous action of chloroform vapour specially exerted on the brain; and, secondly, to the spontaneous evolution of air in the circulating system, probably arising from the peculiar action of the narcotic vapour on the blood. Whatever may be the explanation, observes the author, the facts clearly prove that chloroform vapour may, in certain constitutions, destroy life with tremendous rapidity; and, even in the hands of experienced men, there is no certainty that these dangerous results will not follow in a very unexpected manner. The dangers arising from its use, pointed out by MM. Bouisson and Sedillot, are not exaggerated; and it would be the height of imprudence, with a knowledge of this possible risk of life, to employ this agent in the performance of *minor* surgical operations.

Some discussion followed the reading of this paper.

M. Velpeau thought that the dose of fifteen or twenty drops was too small to occasion fatal consequences. He doubted whether death could be fairly ascribed to the use of chloroform; and considered it more probable that it was one of those instances of sudden death which now and then occur during the performance of trivial operations, and for which no known cause can be assigned. M. Gorré appeared to think that the patient had died in a state of syncope; and he inquired whether the introduction of air into the veins might not have been the cause of death. This, however, is not probable; for death appears to have actually occurred before the commencement of the operation, and, therefore, before any wound could have been made into a vein. Moreover, as the body was not inspected until twenty-four hours after death, and while the temperature was high, the air found in the blood-vessels may really have resulted from putrefaction. M. Velpeau thought, that if death really did result from chloroform, that the case was of too exceptional a kind to justify the conclusion of M. Gorré, that chloroform should be no longer employed in surgical operations.

M. Moreau stated, that M. Robert had lately lost a patient under the use of chloroform, administered during the performance of amputation of the thigh.

M. Roux agreed with M. Velpeau, that it was very doubtful whether death had been here occasioned by chloroform. The mode of administration may have had something to do with the fatal result. When a handkerchief is used, there is always a privation of air and an impediment to respiration. He thought that there might have been a rupture of the lungs in a strong effort to breathe, and that air might thus have found its way into the circulation and have caused death.

M. Baillarger suggested that death might have been occasioned by an attack of syncopal epilepsy, brought on by the respiration of chloroform vapour. It should never be administered to individuals subject to convulsive attacks.

M. Piorry stated, in confirmation of this view, that nervous females who respire it often suffer from violent hysterical attacks.

M. Gibert and M. Amussat considered that the explanation given by M. Roux was probably the true view of the facts—*i. e.* that death had taken place from the introduction of air into the veins, occasioned by a rupture of the lungs.—*Gazette Médicale*, 8 Juillet.

⁂ From this report it will be seen, that these cases of alleged death from chloroform vapour give rise to as much controversy in France as in England. It is to be regretted that the post-mortem appearances were not more fully given. There can be little doubt from the details, that the patient was either dying or dead before the operation was commenced, and it is somewhat surprising that a surgeon should have operated under circumstances calculated to create alarm. The majority of the speakers appear to have considered that death was caused by chloroform vapour. M. Gorré assigned to it a directly poisonous action—a view strongly corroborated by the remarkable state of the blood. MM. Roux, Gibert, and Amussat considered that death was an indirect result of chloroform, assuming that the lung was ruptured in the attempts to respire the vapour, and that air thus found its way into the blood-vessels and destroyed life. If this be true, it is wonderful that, out of some thousands of cases, it has not occurred before: but it is not reconcileable with the altered state of the blood, which bore the characters of poisoning by chloroform; and it is singular that the condition of the lungs is not referred to in order that the correctness of this opinion might be fairly tested. Whether the air in the veins was the result of putrefaction or any other cause it is impossible to say, but it is not a little singular, that in the American case of poisoning by chloroform, elsewhere reported,* bubbles of air were met with in the veins of the brain, although no vein had been opened, and the inspection proved that the lungs were not ruptured.

We think that the short and simple explanation of the matter is, that the woman was poisoned by the vapour of chloroform.

Medical Trials and Inquests.

DEATH DURING THE INHALATION OF THE VAPOUR OF CHLOROFORM.

An inquest was held on Saturday, July 1st, before Mr. Wakley, in Francis Street, Gower Street, on the body of Walter Samuel Badger, Esq. solicitor, of Rotherham, Yorkshire.

Thomas Badger, Esq., Rotherham, on being sworn, stated that he was an attorney, and also coroner for the county of York, and that the deceased gentleman was his son, and was twenty-two years of age. That he (the deceased) left witness at Rotherham on the Wednesday previous, between two and three o'clock p.m.; that he appeared to be then in perfectly good health, and started for London; that he had always been in good health. After running, or taking any violent exertion, deceased would, like other persons, be somewhat out of breath, but he had no difficulty of breathing, and was not subject to fainting fits.

Jane Cornwall deposed, that she is servant to Mr. Robinson, surgeon-dentist, of Gower Street, and that she was present at the death of the deceased gentleman, in the surgery of Mr. Robinson's house, on the previous day (Friday, June 30th); stated that she always attended Mr. Robinson when he administered the chloroform or ether to ladies, and that she was present when gentlemen were the subjects of operation, if the footman happened not to be in the way. That the whole time, from the period when the deceased gentleman entered the surgery to that of his death, *was not more than five minutes.* That the bell rang, and she went in as usual, and, on entering the room, saw the deceased sitting in the operating-chair.

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* Page 79.

That Mr. Robinson said to him, "If you feel afraid, don't take the chloroform;" when deceased replied, that he did not feel afraid, and he would take it. Mr. Robinson observed, "Then I'll give it you; we'll sit down and take it very quietly." Believes that deceased wanted some stumps of teeth extracted. Before deceased had taken *six inhalations*, he said that the chloroform was not strong enough. The apparatus or inhaler was held by Mr. Robinson, at a distance of an inch and a half or two inches from deceased's mouth and nose: *it was not applied close to his mouth and face.* When deceased remarked that the chloroform was not strong enough, Mr. Robinson said, "Let me take them out without." In a moment the gentleman's hand dropped from the part of the chair whereon it was resting, and then his head, and witness never heard him speak or saw him move after. He was talking the instant before his head and hand dropped, and said to Mr. Robinson, "It is very pleasant." Perhaps the inhaler had been taken from before his mouth a second or so before his head and hand fell. It was held by Mr. Robinson himself, and was not before deceased's mouth and nose *a minute* altogether. Of that she is certain. Immediately after deceased's head and hand dropped, Mr. Robinson applied cold water to his face. A surgeon was sent for instantly, and Mr. Hardy and Dr. Waters attended, and tried to bleed him. Bleeding was attempted in less than two minutes after deceased's head dropped. The doctors laid the deceased on the floor. Witness has lived upwards of three years with Mr. Robinson, and firmly believes she has seen him administer the chloroform seven or eight hundred times, and has never seen any ill effects from it at any time; has seen no one faint from its use, and has not heard any one complain of its effects; is positive that the deceased himself asked to have the chloroform administered, and Mr. Robinson requested him not, but to have the operation performed without.

Albert Salton, footman to Mr. Robinson, deposed, that he was present at the death, or immediately after the death, of the deceased gentleman. The bell rang; he went to the surgery. Mr. Robinson said, "Come here!" He went and held deceased's hand. Deceased seemed going off in a fit, and in half a minute Mr. Robinson sent witness for a doctor, and he returned with one in about a minute. That an attempt was made to bleed deceased, when only a few drops of dark-coloured blood were obtained. When witness entered the room, deceased was in the operating-chair, and appeared to be leaning backwards. Dr. Waters laid him on the floor. Witness had let the deceased in when he knocked at the door; he then appeared in good health. Has seen Mr. Robinson administer chloroform in hundreds of cases; ladies have sometimes fainted. Mr. Robinson has not administered ether for six or eight months past, but has used chloroform only.

James Robinson, surgeon-dentist, Gower-street, deposed that he had never seen the deceased gentleman until Thursday; that he applied to witness on that day to have an operation performed on his teeth, but that being engaged, he (Mr. Robinson) was obliged to make an appointment for the following day (yesterday). Just after deceased had entered the surgery, he said that his heart failed him, and that he would not have his teeth out without taking the chloroform. Told him that it would be over in a moment, and that he had better not. He persisted; witness then called in the female servant, the footman being engaged. Put *a drachm and a half of chloroform* on the sponge of the inhaler; that is the usual quantity; then held the inhaler at a distance from his mouth, and he had not inhaled a minute before he said, "It is not strong enough; make it stronger." Witness then asked the girl for the bottle containing the chloroform, but before he could take it from her, to apply more to the sponge, the head and hand of the deceased gentleman dropped. Witness immediately applied cold water to his face with a towel, and poured cold water on his head from a pitcher. He also immediately dispatched his servant for the doctor, and slit up the sleeve of his (the deceased's) coat, for the purpose of bleeding him. At that moment the doctors arrived, and made the attempt, but all their efforts proved unavailing. Had only used a drachm and a half of chloroform altogether; it had been only placed upon the sponge once. Believes that he has administered ether and chloroform, in his own practice and that of operating surgeons, between three and four thousand times. Not a second before deceased's head and hand dropped, he was laughing and talking.

John Waters, M.D., South-crescent, Bedford-square, deposed that he was called to the deceased by Mr. Robinson's footman. Went instantly; found the deceased seated in an operating-chair; on examination of his chest, he thought he could detect three or four contractions of the heart. Attempted venesection, but could only obtain a very small quantity of dark blood. Found him in an erect position; laid him on the floor; cold was applied to the head, and warmth to the extremities. The face was livid; pupils dilated; temperature of body lower than natural; chest exposed. Tried artificial respiration, but all the efforts that were used failed. [Had made a post-mortem examination that morning (Saturday) about twenty hours after death. The body was well formed and muscular; the neck plethoric and rather short; countenance of a bluish livid appearance; eyes [pupils?] dilated, particularly the left; chest well formed, but generally dull all over on percussion, particularly the right side; parietes less resonant over the heart's region than in the natural state. Abdomen prominent, from a deposition of fat; dulness on percussion, extending into the right iliac region; lower extremities not œdematous. On dividing the scalp there was observed some turgescence of the vessels. The membranes presented a congested appearance all over the cerebral mass; there was nothing abnormal in the cerebrum, nor any effusion into either ventricle; the surface of the corpora striata and optic thalami were slightly congested; the cerebellum and pons Varolii offered nothing remarkable. On raising the sternum, observation was made of the very small diameter to which the chest was reduced, for it was found that the lungs and heart were pushed upwards to a line extending between the third and fourth ribs; the lungs were healthy and crepitant throughout their entire extent; there were some adhesions on the right side, of long standing, but no marked congestion.* On dividing the pericardium, no undue effusion of serous fluid was found. The heart looked of a paler colour than usual, and was flaccid, but was not in a hypertrophied or dilated condition; some spots of adipose matter were observed here and there on its surface. On dividing the left ventricle, its walls were found thinner than natural, and its tissue was interspersed with "fatty" degenerescence; this morbid state was particularly observable at the apex, where the muscular tissue only measured about two lines, and the abnormal deposition was very evident at this point; the right ventricle and septum offered nothing remarkable but the lesion of secretion already observed; both ventricles contained clots of dark grumous blood. The inner surface of the aorta felt rather rough, and the mitral valves were unequal at their edges, with some slight rugosity; on dividing their base, the tissue was hard, and made a grating noise under the scalpel. Abdomen: The omentum was loaded with fat; stomach not distended by gases; liver preternaturally enlarged, and extending upwards in a line between the third and fourth ribs; it was of a pale brownish colour, and in some parts almost approaching to a dirty white; this was particularly observable in the Spigelian lobe, where the fatty degenerescence was very evident; there appeared to be no other change of structure. It weighed *eight pounds*.* The other organs of the abdomen were healthy.]† Witness attributes the death to the diseased state of the heart, and the obstruction to the flow of blood through it, produced by the pressure of the enlarged liver. On being asked to connect the history of the case as it had been proved on oath, with the post-mortem appearances, and then to state whether he attributed any ill effects to the inhalation of chloroform, witness said, that in all probability the death would not have happened if the chloroform had not been administered. The death, therefore, might be attributed to the action of the chloroform on an extensively diseased heart.

Mr. Erasmus Wilson deposed that he was present at the examination of the body, with Dr. Waters, and agreed with him as to the morbid conditions which he had described. He attributed death to the stoppage of the heart's action. On being asked to what circumstance or circumstances he attributed the cessation of the heart's action, witness said that it was probably the effect of the chloroform, owing to the diseased condition of the heart and the small space the heart had to act in, occasioned by the pressure of the enlarged liver, and the quantity of fatty matter deposited in the abdomen.

After a summing-up by the Coroner, the jury returned the following verdict:—"That Walter Samuel Badger died from the mortal effects produced by the inhalation of chloroform upon a heart extensively diseased, and greatly obstructed in its action by a liver much enlarged beyond its natural size.—*Lancet*, July 8.

DEATH FROM THE INHALATION OF CHLOROFORM IN THE UNITED STATES.

Report of the principal facts connected with a fatal case of Chloroform Inhalation, which occurred in Cincinnati, on the 23d of February, 1848.

General History.—The subject of the following report, Mrs. Martha G. Simmons, was, at the time of her decease, thirty-five years and ten months old. Her husband states that she generally enjoyed excellent health; sometimes she was "nervous," and suffered occasionally with neuralgic pains about the face and pain in the ear, apparently arising from decayed teeth. She also suffered at times from "sick headache." She was the mother of six children, five of whom were still living; her last accouchement occurred eight weeks previous to her death. Nothing unusual was observed, either at the time of parturition or subsequently;

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* In his evidence at the inquest, Dr. Waters stated that the lungs presented a little sign of congestion.

* The average weight is from four to five pounds.

† From Dr. Waters's report of the post-mortem examination.

her health remained good, and the ordinary quantity of milk was secreted.

On the 23d of February she dined at a quarter past 12 o'clock, and after dinner walked to a dentist's, a distance of about three-fourths of a mile, for the purpose of having some roots of teeth extracted. She arrived at the dentist's 16 minutes before 3 o'clock, appeared slightly flushed from the exercise of walking, but exhibited no alarm on account of inhaling the chloroform.

At 3 o'clock, fifteen minutes after her arrival, Mrs. S. commenced inhaling chloroform. Mrs. Pearson and Mrs. Cross, two female friends, were present, and report the following as the events which occurred:—The respiratory movements appeared to be free; chest heaving. While inhaling, *the face became pale.* At the expiration of about *one minute*, the instruments were applied, and four roots of teeth extracted. The patient groaned, and manifested what they regarded as evidences of pain, while the teeth were being extracted, although she did not speak, or exhibit any other sign of consciousness. As the last root came out, which was about two minutes from the beginning of the inhalation, patient's head turned to one side, the arms became slightly rigid, and the body drawn somewhat backwards, with a tendency to slide from the operating-chair. At this instant, Mrs. Pearson states that she placed her finger upon the patient's pulse; observed that it was feeble and immediately ceased to beat; respiration also ceased *about* the same time. The face, which was previously pale, now became livid, as also did the finger nails; the lower jaw dropped, and the tongue projected a little at one corner of the mouth, and the arms were perfectly relaxed. The females regarded her as being then quite dead. Efforts were made to resuscitate the patient: ammonia was applied to the nostrils, cold water dashed in the face, mustard, brandy, &c. applied. The patient was now removed from the operating-chair and laid on a sofa; but she did not breathe, nor exhibit any sign of life, after being placed in the recumbent position.

Statement of the dentists. — Messrs. Meredith and Sexton, the dentists who operated in the above case, make the following statement:—The patient took the chloroform vapour from Morton's inhaler; it contained a sponge (perhaps one-third filling the glass globe of 4½ inches diameter) saturated with the liquid; to this, 25 drops more were added when the patient began inhaling. Breathing at first slow; inhaled twelve or fifteen times, occupying from a minute to seventy-five seconds. One of the dentists thinks she remained about *ten* minutes in the operating-chair, and that life was not extinct until the end of that time; the other estimates the time at *five* minutes. One says he does not know whether she breathed after being laid on the sofa or not; the other thinks she did not.

The only material difference between the statements of the females and the dentists, relates to the length of time which elapsed from the beginning of the inhalation to the instant of death. The females estimate it at about *two minutes;* the dentists at from *five to ten minutes.* It is clear, however, that the patient could not have been laid on the sofa short of five or ten minutes; for one of the dentists went out to a neighbouring establishment twice to procure resuscitating agents before the patient was removed from the chair, which probably occupied the time specified. But whether the patient continued to breathe during those five or ten minutes, or whether the pulse and respiration ceased at the end of two minutes, when the last tooth was extracted, as supposed by Mrs. Pearson, seems impossible positively to decide. The most that can be said is, that she died within a very short time—not exceeding *ten*, and possibly at the end of *two* minutes.

Medical aid.—After the patient was laid on the sofa, medical aid was sought, and Dr. A. H. Baker was the first physician who arrived: this was probably thirty minutes after respiration had ceased. He immediately pronounced her dead, but proceeded to employ vigorous measures for resuscitation. The principal means employed consisted in artificial respiration, electro-magnetism, and external stimulants. Prof. Locke applied electro-magnetism, which caused active muscular contraction, but no evident effect on the heart. About an hour after the accident, Professors Mussey and Lawson arrived, and aided in the further employment of the means above specified. Not the slightest sign of life was manifested after the arrival of Dr. Baker; the heart did not respond to the electricity, and the only change produced was some slight removal of the lividity of the countenance by the artificial respiration.

Post-mortem examination.—The post-mortem examination was made twenty-six hours after death. Present—Drs. Mussey, Lawson, Baker, and Mulford.

Examination by Dr. Lawson. Record by Dr. Mussey.

External appearances.—Lips livid, but face pale; bloody froth issuing from the mouth. Anterior surface of body and limbs free from discolouration, but posteriorly the skin presented a deep livid hue. Cornea dull and flaccid, and a dull-red horizontal belt extended across each eye, corresponding to the part which was unprotected by the lids; this belt was one-tenth of an inch in diameter, and made its appearance a few hours after death. Limbs quite rigid. Abdomen distended with gas. Patient rather muscular; weight probably from 140 to 150 pounds; hair dark; eyes dark brown; temperament sanguineo-bilious.

Brain.—Integuments contained but little blood. On removing the upper part of the skull, a larger quantity of blood than usual flowed from the vessels of the dura mater. Superficial vessels of the brain moderately distended; two or three ounces of fluid blood, intermixed with bubbles of air, flowed from the sinuses of the dura mater. General aspect, colour, and consistence of the brain, normal.

Lungs.—Considerably but not intensely congested: crepitated freely at all points; no extravasation. Lining membrane of bronchia slightly congested, apparently the result of recent catarrh; deeply stained by the blood. Pleura at all points highly injected; six drachms of bloody serum in the right, and two ounces in the left chest.

Heart and large blood-vessels.—Pericardium contained six drachms of bloody serum. Heart flaccid, *and all its cavities entirely empty:* inner surface of both ventricles and auricles deeply stained. Aorta and pulmonary artery empty; no blood in the cava within the chest, and a very small quantity in the part which lies within the abdomen: indeed, so small was the amount that it could not be appreciated until the vessel was opened. Lining membrane of all the blood-vessels deeply stained.

Abdomen.—One ounce and a half of bloody serum in the right hypochondrium. Stomach and intestines distended with gas. Partially digested aliment, amounting to about three gills, was found in the stomach. Liver paler than natural, arising from the absence of blood; kidneys considerably engorged. No marks of previous disease in any of the abdominal organs. Uterus and bladder normal; the former exhibited the usual condition of the organ two months after delivery.

Blood.—Fluid as water in every part of the body; not a coagulum was seen in any vessel. Examined with the microscope, the globules appeared altered somewhat in form; some were irregular in shape, and they seemed generally distended and more globular than is normal; they were also somewhat fragmentary, a part apparently having been ruptured; their number seemed somewhat diminished. The colour, in every part of the system, was that of dark venous blood.

Sympathetic nerve.—The sympathetic nerve, together with its larger gangalia, including the semilunar ganglion, presented a natural colour.

The Chloroform used. — The specific gravity of the chloroform employed was found to be 1·3. It contained some alcohol, but upon the whole it is regarded as a fair article; it was the same which the dentists had previously used in numerous cases without any unpleasant results.—*Western Lancet*, and *Phil. Med. Exam.* April 1848.

Correspondence.

ON THE USE OF TAR IN CUTANEOUS DISEASES.

Sir,—Will you allow me to express my obligation to Mr. Wetherfield for his observations on the use of tar in cutaneous diseases, in the last number of the Gazette? The notorious intractability of these disorders naturally excites one's attention to any remedy which has proved successful; accordingly, the treatment by tar, especially since the introduction of capsules, has come into very general use; and it is unquestionable that some obstinate cases have yielded to it. I still, however, must maintain my preference for a previous trial of arsenic in decreasing doses, and on a full stomach, for the following reasons:—

1. As far as my experience has extended, it has, when regularly and properly administered, never yet failed in any of the diseases enumerated by your correspondent, provided the patient be free from organic disease, and temperate in his habits. And we have yet to learn whether, in any of the cases of reputed failure, the arsenic has been carefully administered in accordance with the conditions I have specified;—and this is an all-important point; for in a majority of my own successful cases arsenic *had failed*, having previously been tried on an essentially different plan; and in many of them, tar had likewise failed.

2. Arsenic not only cures the disease, but, when continued for a certain time after the final disappearance of the disease, *always* in a great degree, and frequently *entirely*, destroys all tendency to the morbid action. This is not the case with tar. On Mr. Wetherfield's own showing, some of his patients were only relieved for the time, and "suffered repeatedly from the disease."

3. Although Mr. Wetherfield's patients appear to have made no complaints—to their honour be it spoken—yet the odour of tar, to say nothing of its trouble and filth, is to some persons intolerable; and to none can it be agreeable to reflect, that they carry it about with them into every company. Arsenic is not open to this objection.

4. Arsenic, besides being more certain and lasting in its effects, as well as less unpleasant, *is as safe as tar*. Of this I have abundant proofs in the history of many thousands of cases. Nor have I yet met

with a patient who, from idiosyncrasy, could not bear it. I have explained in my book, that where the system was remarkably susceptible, and in a degree intolerant of the remedy, the disease was so much the more amenable to its influence, yielding speedily to such very minute doses as the patient could bear with impunity.

Nevertheless, if I should meet with a case in which arsenic cannot be borne in any dose, I will certainly give a trial to the tar.

I may perhaps be allowed to add, however, that it is our duty in every case, as it will prove our interest, as well as that of the patient, to try at once the most effective remedy we have at hand, especially if it be safe, and subjects the patient to no annoyance.

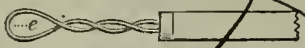
Again thanking your correspondent for his hints, and anxiously courting the most rigid inquiry into my own method of administering arsenic, I remain, sir,
Your obedient servant,
THOMAS HUNT.

Herne Bay, July 1, 1848.

ON THE EXTRACTION OF FOREIGN SUBSTANCES FROM THE CONJUNCTIVA.

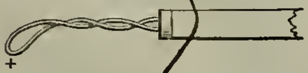
SIR,—Having myself frequently suffered from this cause, and having frequently met with instances where particles of coke expelled from the engine, so small as to be almost invisible, have become impacted in the conjunctivæ of railway travellers, I beg to submit to your notice a small instrument which I have found of service in the extraction of these minute particles, provided that any portion of them projects above the surface of the conjunctiva. It consists simply of a common sewing needle, of sufficient length to be twisted over the flame of a candle into a loop the eighth part of an inch in diameter, and bent so as to form a concavity equal to the convexity of the eyeball; it is filed to form an edge on the inner side of the loop; and the ends are inserted into a small handle, thus—

Direct view.



e, cutting edge.

Profile view.



* The external sharp edge is to be ground or filed off.

In using it, the concave surface is applied to the eyeball so as to enclose the foreign body; the instrument is then drawn in the direction of the handle, and the internal edge, catching against the projecting portion of the body, raises and withdraws it.

The advantages of this instrument are, that it can be introduced within the eyelids, even when closed, and be passed over the surface of the eyeball in any direction, without the slightest fear of injury. Even when the particles are so small as to be invisible to the naked eye, having detected their position by a lens they can thus be scraped off with ease. Lastly, the instrument can be constructed in a few minutes in any situation, no cottage being so destitute as not to be able to provide the materials—viz., a needle, a candle, a file or a whetstone, and a bit of wood for a handle.

I am, sir, your obedient servant,
T. OGIER WARD, M.D. Oxon.

Kensington,
June 30th, 1848.

MR. SOLLY'S CASE OF SCIRRHUS OF THE PAROTID GLAND.

SIR,—In the 36th volume of the MEDICAL GAZETTE (p. 1449) you published a clinical lecture of mine on Scirrhus of the Parotid Gland, and excision of the lower jaw. I now forward to you the ultimate result, regretting that a variety of circumstances have delayed it so long. The wound nearly healed, and that rapidly; but a small point remained near the meatus auditorius externus, from which the disease sprang up again. It extended very slowly from this point *externally*, but it was evidently advancing internally; for the man became amaurotic, and exhibited general symptoms of cerebral disease. He died comatose after some days of insensibility.

My colleague, Mr. Dixon, examined the parts after death, and has kindly drawn up the following account.—I am, sir,
Your obedient servant,
SAMUEL SOLLY.

The following is a short account of the morbid parts removed from your patient, Thomas Partner. I did not see the preparation until after it had been nearly five months in spirit; so that the dissection was far less satisfactory than it otherwise would have been.

An irregular soft tumor occupies the inner half of the right middle fossa of the skull, spreading over the petrous portion of the temporal bone, and for some distance along the basilar process of the occipital. Throughout this extent it adheres to the dura mater, although it may be detached from that membrane without tearing; but around the internal auditory foramen, and thence to the apex of the petrous portion of the temporal bone, the tumor and dura mater are inseparably united to each other. The 9th and 8th nerves pass freely out of the skull, but the facial and auditory nerves cannot be disentangled from a dense nodule of the morbid growth, which envelopes them at their entrance into the foramen auditivum. The trunk and ganglion of the 5th nerve are also completely imbedded in the tumor. Of the nerves which pass along the cavernous sinus, the 3d can alone be recognized, and that very indistinctly, as the tumor has penetrated the outer wall of the sinus, and matted together the 4th and 6th nerves, and the ophthalmic branch of the 5th. The optic nerve is quite free from disease.

The osseous structure of the skull does not appear to be changed, except just around the foramen ovale in the sphenoid bone, where it is discoloured and rather soft; and here the corresponding portion of dura mater is thickened.

The inferior maxillary nerve, as it is passing through the foramen, is pulpy. Its inferior dental branch, at the foramen, and the second division of the 5th nerve, where it emerges on the cheek, appear to be undiminished in bulk. The teeth in the lower jaw are firmly set in the gums, and it seems probable that the trunk of the dental nerve was not divided in the operation, as I remember the patient retained feeling in the chin and lower lip, after the ramus of the jaw had been removed.

Of course no very accurate examination can be made of a tumor which has been so long steeped in spirit. The diseased growth within the skull seems chiefly made up of nucleated cells; and that in the parotid region presents the same structure, but many of its cells are caudate.

ON THE CAUSES OF THE CRACKED METAL SOUND.

SIR,—The reviewer of Dr. Blakiston's work on Diseases of the Chest, in the number of the British and Foreign Medico-Chirurgical Review for the last quarter, commenting on the author's variance in the cause of production of the cracked metal sound with Dr. Walshe, details two other conditions under which it may occur, which in the reviewer's opinion corroborates the view of the latter physician.

Laennec imagined that both air and fluid in the pulmonary excavation were necessary for its production; the bruit de pot fêle was deemed by him to be pathognomic of a vomica in the lung.

Dr. Walshe thinks that air alone is necessary for its production, and the immediate physicial cause for its elicitation to be a forcible expulsion of air from an anfractuous excavation in the lung into the air-tubes entering it.

The reviewer, after hinting that the occasional absence of the sound may be due to the blocking up of some of the bronchial tubes leading to the vomica, by some of its, as well as of their own contents, (which must under such circumstances be unusually viscid); or to the imperfect manner in which percussion is often formed, states that the cracked metal sound can be elicited under the following circumstances:—

1. In a cavity quite empty of fluid, freely communicating with the surrounding bronchial tubes.

2. In compression of the lung from pleuritic effusion, and where the tubular, amphoric, or amphorotympanitic sound is usually produced on percussion: here the sound on percussion is often very analogous to the bruit de pot fêle.

The reviewer remarks, if such be correct, a jogging and splashing of air with fluid in a cavity is not indispensable for its production. Dr. Stokes has also remarked, that in some cases of bronchitis in young subjects, the sound on percussion over the lower and back portions of the lungs, is often like the cracked-jar sound of cavities.

My object, sir, in making these remarks, is to point out another condition under which this sound may be present; this may be detailed as follows:—I was asked about six months back to see a lad, who had had a pulmonary complaint, (imagined to be phthisis) for two years past; he was moribund when I saw him, and died two hours after.

On percussing the upper part of the left side immediately under the clavicle, the cracked metal sound was elicited in the most perfect manner.

On post-mortem inspection (corresponding to the part where the sound was produced during life), two circumscribed portions of sub-pleural emphysema were seen together as large as a full sized hen's egg; there was a cavity in the left lung, nor was the disease of a tuberculous character; it was an example of chronic pneumonia. It is unnecessary to particularize the other morbid appearances: suffice it that the circumscribed interlobular and subpleural emphysema elicited a sound indistinguishable from the bruit de pot fêle of pulmonary excavations.

I will not occupy your space further than to remark, that the physical cause of its production was the collection of air chiefly in the cellular tissue over the upper portion of the left lung, which, by forcible percussion, was made to permeate the surrounding cellular tissue, returning after the percussion stroke to the situation where, before the stroke, it was chiefly collected.

The entire lung was condensed, unfitted for respiration, and closely adherent (except at the upper part) to the walls of the chest; the emphysema was doubtless due to a rupture of a superficial air-cell, and prevented extending by the thickened and adherent state of the pleura, which had recently been inflamed.—I remain, sir,

Your obedient servant,
R. C. Golding.

29, King William Street, Trafalgar Sq.,
July 7th, 1848.

DEATH FROM CHLOROFORM IN INDIA.

Sir,—The following case of death from the inhalation of chloroform vapour has been communicated to me; and feeling the importance of placing similar facts fairly before the profession, I trust you will give it insertion in your journal. It is extracted from Allen's Indian Mail, July 4th.—I have the honour to be, sir, your obedient servant,

Robert Barnes, M.B.

Gloucester Terrace, Hyde Park,
July 11, 1848.

At Hyderabad. From the pen of the operating surgeon. Furnished by Dr. Hardinge, to whom it was addressed for public communication:—" A most distressing case has just occurred in my public practice here. Chloroform has proved fatal in my hands. A young woman presented herself this morning with disease of the distal phalanx of the middle finger of the left hand, requiring amputation at the middle joint. As she appeared of timid disposition, and exhibited more than usual reluctance to submit to the little operation, I administered a drachm of chloroform in the usual way, namely, by sprinkling it on a pocket-handkerchief and causing her to inhale the vapour. She coughed a little, and then gave a few convulsive movements. When these subsided, I performed the necessary incisions, which, of course, did not occupy more than a few seconds. Scarcely a drop of blood escaped. The patient was then put into the recumbent posture with the head low. Active means were taken to bring her out of the state of coma into which she had apparently fallen. But although these means, including artificial respiration, were perseveringly employed for five hours, the *unfortunate woman never breathed again.* I am inclined to think that death was almost instantaneous; for after the convulsive movement above described, she never moved, or exhibited the smallest sign of life. No opportunity was afforded me of making a post-mortem examination; so that it must for ever remain a secret whether or not there were any special circumstances, such as aneurism of one of the great vessels, or disease of the heart."

[The chloroform was supplied by Messrs. Twemlow and Co., Bombay. It required a drachm and a half of the same chloroform in another case to produce a slight effect.]

Medical Intelligence.

THE ASIATIC CHOLERA IN RUSSIA.

The following is an extract from a letter dated St. Petersburgh, June 19 (July 1):—"The cholera has now raged here for more than a week, and about 800 cases are reported daily. The great mortality among the Moujiks has led them, in their ignorance, to believe that they are being poisoned wholesale, and yesterday several disturbances took place, in consequence of some of the people attacking persons whom they suspected of strewing poison over the provisious exposed for sale in the markets. One man was beaten to such a degree that he has since expired, and a respectable English merchant (resident of this place) who attempted to interfere, was hardly able to escape a similar fate. Summary punishment has, however, been inflicted by the authorities on the poor deluded Moujiks who were the principal aggressors, for three of them were this morning publicly flogged in the market-place. A letter dated Bucharest, June 23, announces that politics are completely in abeyance in consequence of the fearful spreading of the cholera within the last few days. The number of cases are now 186 a day, of whom a fifth are rapidly carried off. An universal panic has seized all the inhabitants, and every person that can fly from the city to the mountains does so in the greatest haste. Even the gipsies of Transylvania have demanded their passports in order to hasten home, and, if possible, escape the fearful contagion. All the public tribunals are closed.

THE WOUNDED IN PARIS.

According to an official return, published in the *Moniteur*, 1,179 wounded still remained in the civil hospitals of Paris on Saturday.

In the Military hospital of the Val-de-Grâce there are no less than 500 cases of wounds, many of them of a very severe description.

According to a circular published by M. Thierry, it appears that the late struggle for "liberty, equality, and fraternity," was attended with the following results:—

From the 23d to the 28th June, there were received into the hospitals 1781 cases of wounds; but of these, 162 were dead when brought in. In addition to these there were in five days 195 deaths. On the 29th June there remained in the hospitals 1267 wounded; and in the temporary Ambulances 364, making a total of 1631 persons still under treatment.

OBITUARY.

On Saturday, the 24th inst., in his 47th year, John M. M. Jameson, M.D., late of the Highway, Enfield.

At Southampton, on the 4th inst., James Claudius Paxton, Esq., M.B. and Radcliffe Travelling Fellow of the University of Oxford.

On the 30th ult., at Cavan, after a short illness, Doctor M'Donald, one of the oldest practitioners in the north of Ireland. For upwards of 30 years he was physician to the county fever hospital in that town: the ordinary duties of which (together with a most extensive practice,) he discharged with that skill and untiring energy that marked his whole life.

On the 26th ult., of fever, at the residence of his brother, Partry-house, Mayo, George Lynch, Esq., M.D., aged 34, late physician to the Fever Hospital, Ballinrobe, and fifth son of the late Major Lynch, of Partry-house, Mayo.

On the 9th inst., at Oxford, Charles Webb, Esq., surgeon, aged 53.

Selections from Journals.

FORENSIC MEDICINE.

ON THE SIGNS OF DEATH. BY M. BOUCHUT.

From his inquiry into the circumstances by which apparent death may be distinguished from real death, M. Bouchut has ascertained that all forms of apparent death, especially those which are due to asphyxia and syncope, present, whatsoever be the diversity of their symptoms, one common character—namely, the persistence of the pulsations of the heart—which distinguishes them from real death. A commission of the French Institute, appointed to inquire into the merits of M. Bouchut's investigations on this subject, report, that having repeated his observations and experiments upon man and animals, in which syncope has been carried to its utmost limits, they can fully confirm the fact, that in all such cases the pulsations of the heart continue, and may be detected by auscultation. According to M. Bouchut, the certain signs of death are of two kinds—immediate and remote. The immediate signs of death in man are—first, prolonged absence of the movements of the heart, as recognizable by auscultation; secondly, the simultaneous relaxation of all the sphincters, due to the paralysis of those muscles; and lastly, the flaccidity of the globe of the eye, and the loss of transparency of the cornea. In the opinion of the Commission, these signs have not an equal value, the first being by far the best and most certain. For, if ever the movements of the heart are undetectable by auscultation, for a period of five minutes together, it may with certainty be concluded that death has ensued. Moreover, this cessation of the movements of the heart is always accompanied by two striking phenomena—namely, the arrest of the respiratory movements, and loss of sensation and of the power of motion. The second circumstance—namely, the simultaneous relaxation of the sphincters—admits of more doubt as a certain sign of death. The condition of the eye, the Commission thinks, cannot with safety be taken into consideration as a sign of death. So that cessation of the movements of the heart is the only certain proof of the complete cessation of life. The remote signs of death are stated by M. Bouchut to be—cadaveric rigidity, absence of muscular contraction on the stimulus of galvanism, and the occurrence of putrefaction. These points are admitted by all medical jurists, and cannot be disputed. Since general putrefaction of the body, however, only ensues after the lapse of a considerable time subsequently to the manifestation of the other signs, it is not necessary to wait for its occurrence before pronouncing on the reality of death; consequently, all houses established for the purpose of keeping bodies until putrefaction commences, as is done in Germany, must be productive of no advantage. The Commission also urges the necessity, in all cases, of entrusting to medical men the duty of deciding whether death be real or apparent; for by them only can the cessation of the heart's movements, the existence of cadaveric rigidity, and the loss of muscular contractility, be recognised and rightly estimated.—*Gazette Médicale*, Mai 31, 1848. Δ

DR. MEIGS ON THE USE OF CHLOROFORM IN MIDWIFERY.

(Extract from a letter addressed to Dr. Simpson.)

I have been accustomed to look upon the sensation of pain in labour as a physiological relative of the power or force; and notwithstanding I have seen so many women in the throes of labour, I have always regarded a labour-pain as a most desirable, salutary, and conservative manifestation of life-force. I have found that women, provided they were sustained by cheering counsels and promises, and carefully freed from the distressing element of terror, could in general be made to endure, without great complaint, those labour-pains which the friends of the anæsthesia desire so earnestly to abolish and nullify for all the fair daughters of Eve. Perhaps, dear sir, I *am* cruel in taking so dispassionate a view of the case; and it is even possible that I may make one of the number of those "amazed" converts of whom you speak in your worthy letter to me. But, for the present, regarding the pain of a natural labour as a state not, by *all* possible means and always, to be eschewed and obviated, I cannot bring myself to the conviction that of the two, whether labour-pain or insensibility, insensibility is to be preferred. If I could believe that *chloroformal* insensibility is sleep indeed, the most considerable of my objections would vanish. Chloroform is not a soporific; and I see in the anæsthesia it superinduces a state of the nervous system in no wise differing from the anæsthetic results of alcoholic potations, save in the suddenness and transitiveness of its influence. I freely admit, for I know it, that many thousands of persons are daily subjected to its power. Yet I feel that no law of succession of its action on the several distinct parts of the brain has been or can be hereafter ascertained, seeing that the succession is contingent. Many grave objections would perhaps vanish could the law of the succession of influences on the parts of the brain be clearly made out, and its provisions ensured. There are, indubitably, certain cases in which the intellectual hemispheres are totally hebetized, and deprived of power by it, while the co-ordinating lobes remain perfectly unaffected. In others the motor cords of the cerebro-spinal nerves are deprived of power, whilst the sensitive cords enjoy a full activity, and vice versâ.

I readily hear, before your voice can reach me across the Atlantic, the triumphant reply that an hundred thousand have taken it *without accident!* I am a witness that it is attended with alarming accidents, however rarely. But should I exhibit the remedy for pain to a thousand patients in labour, merely to prevent the physiological pain, and for no other motive—and if I should in consequence destroy only one of them, I should feel disposed to clothe me in sackcloth, and cast ashes on my head for the remainder of my days. What sufficient motive have I to risk the life or the death of one in a thousand, in a questionable attempt to abrogate one of the general conditions of man?

As to the uses of chloroform in the medical or therapentical treatment of pain, the question changes. There is no reasonable therapia of health. Hygienical processes are good and valid. The sick need a physician, not they that are well. To be in natural labour is the culminating point of the female somatic forces. There is, in natural labour, no element of disease—and, therefore, the good old writers have said nothing truer nor wiser than their old saying, that "*a meddlesome midwifery is bad.*" Is chloroformization meddlesome?

If I were amputating a limb, or extirpating a tumor, I should see all the steps of my incisions, ligations, &c. But if I apply my forceps in a right occipito-posterior position, (fourth of Baudeloque,) I know that I thrust the blade of the male branch far upwards betwixt the face of the child and the upper third of the vagina, which, in this case, is already greatly expanded, and that the extremity of the blade is separated from the peritoneum only by the mucous and condensed cellular coat of the tube. Now no man can *absolutely* know the precise degree of inclination his patient will give to the plane of her superior strait, while in pain; an inclination to be modified by every movement of her body and limbs. Under such absolute uncertainty, the best guide of the accoucheur is the reply of the patient to his interrogatory, "Does it hurt you?" The patient's reply, "Yes and No," are worth a thousand dogmas and precepts, as to planes and axes, and curves of Carus. I cannot, therefore, deem myself justified in casting away my safest and most trustworthy diagnosis, for the questionable equivalent of ten minutes exemption from a pain, which, even in this case, is a physiological pain.—*Phil. Med. Exam.*, March 1848.

PHYSIOLOGICAL ACTION OF CHLOROFORM.

To understand the physiological action of this substance, it is necessary to remember that sensation is dependent, first, on the existence of consciousness, which is a function of the brain proper (that is, all that portion of the encephalon situated above the corpus callosum); secondly, on the integrity of the spinal cord; and thirdly, on the integrity of the expanded filaments of the nerves which receive the impression. Loss of sensation may be caused by injuring either of these portions of the nervous system; for, if the nervous filaments are diseased, impressions cannot be received; if the spinal cord be injured, impressions are not transmitted to the brain; and, if the brain be disordered, the consciousness of the impression is not experienced. Now the object of giving chloroform ought to be to suspend the brain's functions without affecting the spinal cord, the medulla oblongata, or the sensibility of nerves, and thus produce loss of sensation by rendering the mind unconscious of the impressions made upon nerves. It is questionable, therefore, whether chloroform or ether should be denominated anæsthetic agents, because anæsthesia is generally understood to mean loss of sensibility in a part; whereas, in point of fact, it is suspension of the faculties of mind, and *unconsciousness* of external stimuli, that they produce. In man this is rendered apparent by the fact that the functions of circulation, respiration, uterine contractions, &c. &c. proceed during the comatose state, which would not be the case if the sensibility of the nerves distributed to those organs were destroyed. In animals, similar facts may at once be demonstrated by the action of galvanism, which, when they are perfectly comatose, produces convulsions, spasms, and other reflex movements.—*Dr. H. Bennett's Report; Edinburgh Monthly Journal*, Jan. 1848.